DEPARTMENT of ENVIRONMENTAL SERVICES
Water Division - Watershed Management Bureau

LAKE TROPHIC DATA

MORPHOMETRIC:

Lake:	BLUE POND	**Lake Area (ha):**	3
Town:	MADISON	**Maximum Depth (m):**	12.4
County:	CARROLL	**Mean Depth (m):**	7.9
River Basin:	MERRIMACK	**Volume (m^3):**	237000
Latitude:	43°43'54" N	**Relative depth:**	6.3
Longitude:	71°71'10" W	**Shore Configuration:**	1.15
Elevation (ft) :	500	**Areal water load (m/yr):**	0.79
Shore length (m):	692	**Flushing Rate (yr^{-1}):**	0.1
% Watershed Ponded:	3	**P retention coeff.:**	0.75
Watershed Area (ha)	15	**Lake Type**	natural

BIOLOGICAL:		**05-Feb-04**	**03-Sep-03**
DOM. PHYTOPLANKTON (% TOTAL)	#1	RHIZOSOLENIA 60%	UROGLENOPSIS 45%
	#2	DINOBRYON 30%	DINOBRYON 15%
	#3	UROGLENOPSIS 5%	
CHLOROPHYLL-A (ug/L)			1.24
DOM. ZOOPLANKTON (% TOTAL)	#1	ciliate spp. 45%	ciliate spp. 56%
	#2	KERATELLA 20%	KERATELLA 23%
	#3	ROTIFER SPP. 20%	BOSMINA 6%
ROTIFERS/LITER		10	33
MICROCRUSTACEA/LITER		1	17
ZOOPLANKTON ABUNDANCE (#/L)		20	113
VASCULAR PLANT ABUNDANCE			Common
SECCHI DISK TRANSPARENCY (m)			10.2
BOTTOM DISSOLVED OXYGEN (mg/L)		9.3	12.8
BACTERIA (E. coli, #/100ml)	#1		<10
	#2		<5
	#3		

SUMMER THERMAL STRATIFICATION:

stratified

Depth of thermocline (m):	5.6
Hypolimnion volume (m^3):	46000
Anoxic Volume (m^3):	None

CHEMICAL: **Lake: BLUE POND**
Town: MADISON

	05-Feb-04		03-Sep-03		
DEPTH (M)	4.0	8.0	3.0	7.0	10.0
pH (units)	5.9	5.9	6.2	6.1	6.1
A.N.C. (Alkalinity)	4.1	4.0	4.1	5.0	5.3
NITRATE NITROGEN	< 0.05	< 0.05	< 0.05		< 0.05
TOTAL KJELDHAL NITROGEN	< 0.25	< 0.25	0.30	< 0.25	< 0.25
TOTAL PHOSPHORUS	< 0.005	< 0.005	0.010	0.010	0.006
CONDUCTIVITY (umhos/cm)	22.5	22.7	21.0	21.9	22.2
APPARENT COLOR (CPU)	< 5	< 5	< 5	< 5	< 5
MAGNESIUM			0.22		
CALCIUM			1.8		
SODIUM			1.7		
POTASSIUM			< 0.40		
CHLORIDE	< 3	< 3	< 3		< 3
SULFATE	2	2	2		2
TN : TP	60	60	33		25
CALCITE SATURATION INDEX					

All results in mg/L unless indicated otherwise

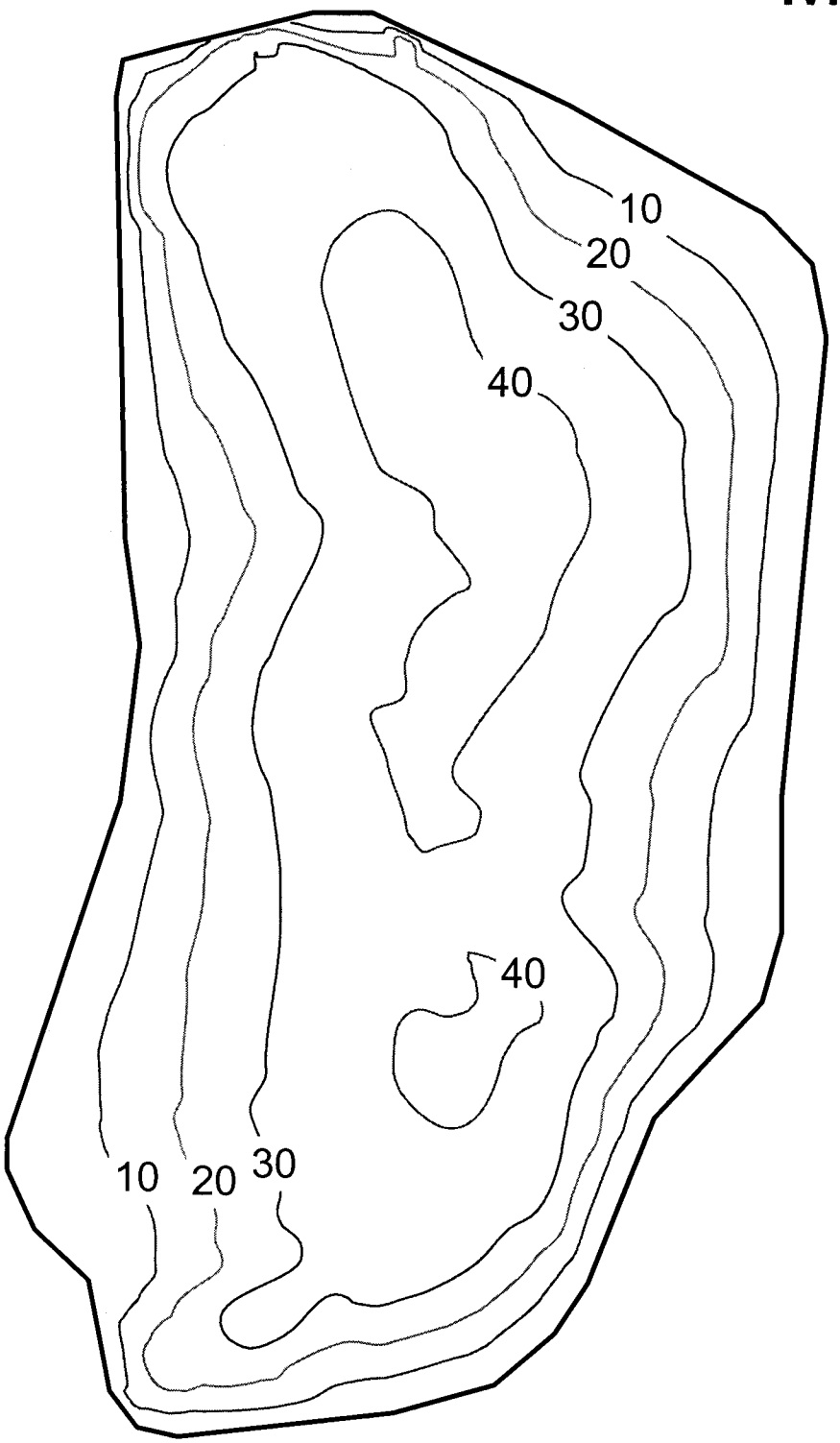
TROPHIC CLASSIFICATION: 2003

D.O.	S.D.	PLANT	CHL	TOTAL	CLASS
0	0	3	0	3	OLIGO

COMMENTS:

1. Previously surveyed in 1984. No change in classification and little change in trophic parameters between the two years.
2. No public access; need permission of owner to pass a gate and travel down a 4-wheel drive road to the pond. Canoe or kayak access only.
3. Moderately acidic, very clear water, somewhat remote pond.
4. The dissolved oxygen (DO) was greatest below the thermocline at 5.6 meters. Cold water holds more oxygen than warm water at 100 % saturation, and this increase in DO with depth (orthograde profile) can occur in very unproductive lakes where there is little or no oxygen demand in the bottom waters. In Blue Pond, not only did the DO increase with depth but it became super-saturated (> 100%). This is because sunlight could penetrate to the bottom in this very clear water pond (note the very deep Secchi transparency reading), allowing bottom plant growth to produce oxygen through photosynthesis and, due to the slow diffusion of gases in water, result in a supersaturation of oxygen.

Blue Pond
Madison



10 foot depth contours

N

0 0.05 0.1 Kilometers

FIELD DATA SHEET

LAKE: BLUE POND **TOWN:** MADISON

DATE: 9/3/03 **WEATHER:** Partly sunny, cool & breezy

	DEPTH (M)	TEMP (^{o}C)	DISSOLVED OXYGEN (mg/L)	PERCENT SATURATED
	0.1	21.4	8.3	93.5
	1.0	21.3	8.3	93.2
	2.0	20.8	8.7	97.0
	3.0	20.7	8.7	97.1
	4.0	20.6	8.5	94.2
	5.0	20.5	9.2	102.2
	6.0	18.1	11.5	121.9
	7.0	16.8	12.3	126.3
	8.0	15.6	12.4	124.7
	9.0	14.9	12.8	126.9
	10.0	14.6	12.9	126.7
	10.5	14.6	12.8	126.1

SECCHI DEPTH (m) : 10.2

BOTTOM DEPTH (m) : 11.0

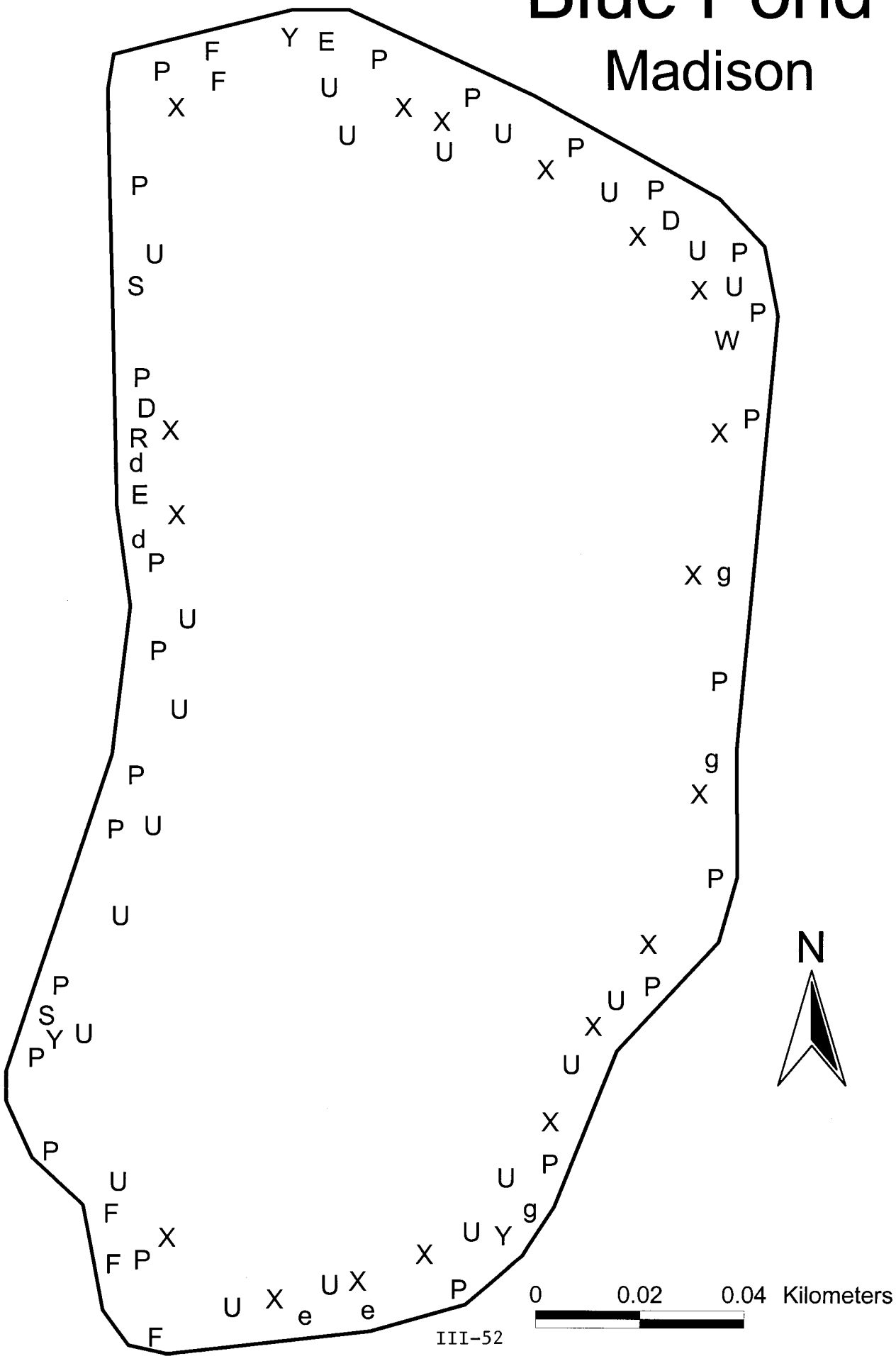
TIME: 1400

COMMENTS:

The D.O. was higher in the cold bottom waters than at the surface and the Secchi transparency was nearly to the bottom. See "Lake Trophic Data" comments for more explanation.

Blue Pond

Madison



AQUATIC PLANT SURVEY

LAKE: BLUE POND **TOWN:** MADISON **DATE:** 9/3/03

KEY	PLANT NAME		ABUNDANCE
	GENERIC	COMMON	
F	Nymphoides cordatum	Floating heart	Sparse
P	Pontederia cordata	Pickerelweed	Common
U	Utricularia	Bladderwort	Common
e	Eleocharis	Spike rush	Sparse
X		Sterile thread-like leaf	Common
g	Spongilla	Freshwater sponge	Sparse
Y	Nuphar	Yellow water lily	Sparse
W	Potamogeton	Pondweed	Sparse
E	Eriocaulon septangulare	Pipewort	Sparse
S	Sparganium	Bur reed	Sparse
d	Dulichium arundinaceum	Three-way sedge	Sparse
R	Sarracenia purpurea	Pitcher-plant	Sparse
D	Drosera	Sundew	Sparse

OVERALL ABUNDANCE : Common

GENERAL OBSERVATIONS :

1. Most plants were tight to the shore because the water depth drops off quickly. Submerged bladderwort and sterile, thread-like bottom growth were common further from shore and could grow at depth because of the deep light penetration.
2. Several dead trees on the bottom.
3. Observed one painted turtle.